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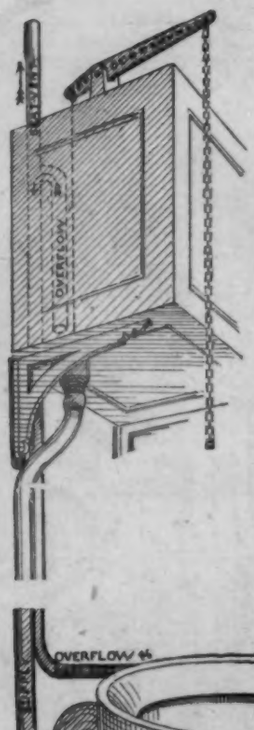
The Cathedral and the Statue of Gattamelata, Padua, Italy.
(Gelatine Print issued only with Imperial Edition.)
Competitive Design for Church, Clergy-house, etc., New York, N. Y.
Wooden Model of Horse for Gattamelata's Monument at Padua.
Monument to Bartolomeo Colleoni, Venice.
House Built in 1730 at Grey's Ferry, Philadelphia, Pa.
Science Hall, Randolph Macon College, Ashland, Va.

THE

SANITAS WATER CLOSET



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THE Trustees of Columbia College have voted to establish a Fellowship in the Department of Architecture of the College, of the value of six hundred and fifty dollars a year, but payable as a biennial gift of thirteen hundred dollars, so that the holder may be enabled to pursue post-graduate studies abroad during that period. The fellowship is founded as a compliment to Mr. F. A. Schermerhorn, to whom the University owes the Department of Architecture, which was established at his instance, and at his expense endowed with the best equipment possessed by any architectural school in the country, and maintained during its early years. The fellowship will be confined to graduates of the Department, and will be awarded after a competitive examination. This makes the third endowed course of study in Europe now open in this country to students who wish to compete for this most valuable addition to an architect's education. We do not, perhaps, realize that such advantages are not offered in any other country in the world. In France, it is true, the Prize of Rome opens to the fortunate winner a reputation and assurance of future employment which the American scholarships do not, but, in return, the American scholarships leave their possessors much freer to follow their own inclinations in the matter of study, and, being generally given to men who have had a certain amount of practical experience, instead of to students fresh from school, they encourage their holders to sketch and pick up knowledge of all sorts, in a way which would be injurious to persons just set free from their lectures and drill in classical design. It is a satisfaction to think that the more such scholarships multiply, the more it will become the habit of young architects and draughtsmen to avail themselves of the advantages that they offer, and the pleasanter it will be for the holders of the three scholarships to form a little party for travelling and sketching together. Experienced architects, who have made their dozens of trips across the ocean, do not always reflect, in their surprise at the smallness of the number of applicants for the existing scholarships, that a prize which consists in two years of exile, alone among strangers, and in countries where the architectural student must necessarily depend upon his knowledge of foreign languages to enable him to study to advantage much of the best work, presents a good many terrors, as well as attractions, to the average American youth recently from college, and an arrangement by which the three American travelling-students may have the advantage of mutual companionship, at least during the first few months of their tour, would add much to the attraction of the examinations.

A MOVEMENT has been started for a great exhibition, under the auspices of the three Americas, to be held in Washington in 1892, the four hundredth anniversary of the discovery of America by Christopher Columbus. Spain and Italy, both of which have a claim on the memory of Columbus, have, it is said, shown a disposition to take part in the celebration, while Mexico, which had at one time an idea of getting up an exhibition of its own in the same year, and in honor of the same event, will probably be glad to expend the energy which was not quite sufficient for its own show to making a creditable appearance at ours The South American States, unless they should be occupied by that time in a general war, which is said to be possible, will undoubtedly be glad to make another demonstration of their increasing wealth and enterprise, and it is to be hoped that our own people will do their best to help the affair along. It is said that thousands of farms in the United States were mortgaged in 1876, in order that their owners might go to the Philadelphia exhibition. If that is so, it will be about time in 1892 for the children of the Centennial enthusiasts to take their turn at seeing the wonders of the world. The site proposed for the Exhibition buildings is the reclaimed ground of the Potomac Flats, close to the Washington Monument. If this is sure to be free from danger of malaria, it seems to be very suitable, and Washington itself is as pleasant and attractive a town for the purpose of celebrating a grand holiday as could be found anywhere. It does not appear just who are the leaders of the movement in this country at present, but more particulars will undoubtedly be forthcoming before long.

M. HENRI MAMY is publishing in *La Construction Moderne* some papers on theatrical scenery and effects which may be of use to architects. Some of the apparatus that he describes is new, and in regard to that which is old some useful hints are given. Most persons have seen the representation on the stage of a ship at sea. The ship in this case is placed on rollers, which run on two pieces of plank, cut out in the shape of waves. By pulling the ship with a rope, it is made to pitch and roll in a very lifelike manner. The distance is formed by a painted scene, representing a storm at sea, with black clouds, white foam, etc. The agitation of the foreground waves is still obtained by the primitive plan of covering the front of the stage with blue and green cloths, under which a lot of boys prance and run, producing a tolerably perfect illusion. M. Mamy says that the two-legged waves do not always behave as they should. Occasionally they are lazy, and the director of the theatre of the Porte St. Martin was accustomed, when he had a marine piece on the boards, to keep an eye on the waves, and, when the fury of his storm appeared to be subsiding, he would sally forth, and, with a few well-directed kicks, would reanimate the ocean to the point desired. In an English theatre once, the wave-boys, just as the ship containing the hopes of the audience was in the midst of its perilous drift across the stage, struck for higher pay. The director refused to grant it, but a look at his ship plunging and struggling in the midst of a dead calm changed his mind. He hurried back to promise the increased pay, and the sea was immediately thrown into a commotion as violent as any one could wish. Where it is desirable to change a scene with great rapidity, the two scenes which are to follow each other are sometimes painted on opposite sides of strips of zinc, which are arranged like the rolling slats of a blind. By a single movement of a wire, one scene is transformed into the other. If a costume is to be changed, instead of a whole scene, the transformation is usually effected by having the costume to be worn first put on over the other, and making the outer costume in two pieces, opening at the sides, and fastened by lacing-cords through eyelet-holes provided for the purpose. The lower ends of the cords have rings on them, and the upper ends are slightly fastened under a rosette or some other detachable ornament. If, for example, the godmother of the story has to transform herself into a fairy on the stage, her peasant costume is put on in this way over the robes of Fairyland. At the appointed time the old lady places herself just in front of a small trap in the stage, which is previously marked with chalk for her information. At a certain cue she places her hand on her shoulder, where there is a rosette, or perhaps a tuft of rags, and detaches the ends of the strings. At the same moment a hand emerges

from the little trap behind her and seizes the rings on the cords, and pulls them, when the peasant's costume disappears, to give place to the airy skirts of the fairy, while the wand, the indispensable attribute of the stage fairy, is handed to her from the same trap. One of the most effective pieces of stage machinery is that by which the heroes or heroines pass through solid walls. This is arranged by having the fictitious wall or rock, or whatever it may be, made of canvas, with light doors in it, which close with a spring. As the hero, closely pressed by his enemies, approaches the rock, he takes aim at the proper spot and darts through the spring doors, which close so quickly after him that the audience does not see how the feat is performed. A variation of this was devised for use in the "Roi Carotte." In that play one of the personages is seen on the stage, turning over the leaves of an immense book. The book is illustrated with pictures, and, as the leaves are turned, the people in the pictures jump out of the book, climb down on the stage, turn a few somersaults, and then jump back into their places on the page. This curious effect was obtained by making the middle of the pages of India-rubber, with a cut through the centre. The book lay on a table, the front of which was concealed by some other objects, while the top was perforated with a hole large enough for a man to get through, and covered by the book. A lively boy was concealed under the table, with such costumes as he needed, and at a preconcerted signal he would jump out through the India-rubber, caper a moment about the stage, and jump back again.

LA SEMAINE DES CONSTRUCTEURS makes a complaint that is frequently heard here — that it seems to be impossible to keep apartments of moderate size and rent free from vermin. As it says, in the modern, as well as the older houses, it is the rule to find bugs under the wall-papers, which are the universal decoration in Paris, most of them belonging to colonies of emigrants, which have been sent out from some slovenly household in the neighborhood, and have multiplied under the papers, in spite of all the efforts of the neater housekeepers to exterminate them. There are thousands of houses, inhabited by clean and well-bred people, where this nuisance persists, in spite of all efforts, and *La Semaine* asks if there is no remedy, short of the substitution of paint for paper, which, though effectual, does not please the taste of the Parisians. If any of our readers know of anything that can be done, many persons will be glad to hear of it. We might suggest that the paste for putting on papers in such cases should be mixed with corrosive sublimate, which would poison the bugs, besides preserving the paste from souring, and need not be dangerous to the lives of the occupants of the rooms, but a washable paint is undoubtedly much to be preferred in all such buildings.

A RATHER singular personal discussion is just now going on in Vienna, over the new Court Theatre, which is very magnificent, but which has the defect that the actors cannot be heard in it. The architect is Baron von Hasenauer, one of the most distinguished architects in Europe, and the newspapers seem to have been stimulated by his conspicuous professional position to lay a good deal of blame on him for the bad acoustic quality of the buildiug. Naturally, Baron Hasenauer does not like this, and his friends have undertaken to defend him by explaining that the plan of the structure is not due to him, but to the late Professor Semper, who prepared before his death the scheme which was carried into execution by Hasenauer. This explanation, which has probably some reason in it, far from allaying the trouble, has, as it seems, stirred up Professor Hans Semper, the son of the great architect, who demands an opportunity to demonstrate before a jury of architects that the defects of the theatre arise from errors in design and construction which do not exist in the original plans, but were introduced by Baron Hasenauer. Which of the disputants is right it is impossible to say, and, in fact, in matters of the acoustics of buildings it is beyond the power of any person, architect or not, to make explanations that are of any value beyond the most rudimentary observations for the reason that no one knows, beyond such simple observations anything about the causes which make a building hard to hear in, or the remedy for such a state of affairs, if it exists. Meanwhile, Baron Hasenauer's friends, including Baron Hansen and many other architects of high distinction, have shown their sympathy with him by presenting him with a eulogistic address.

ON the fifth of April, the order was given for the immediate execution of the works which are to extend the sewers of Paris, so as to receive the house-wastes from the whole city, instead of from a small part, as is now the case, and convey them to the sandy peninsula of St. Germain, there to be used in fertilizing the market-gardens from which the markets of Paris are to be supplied. The land necessary for irrigation has been taken possession of, the scheme of conduits needed for bringing and applying the sewage to it has been carefully worked out, and nothing remains but to carry the plans into execution. To see that this task is properly performed, and with due regard to all public interests, a Commission has been appointed, not only to watch the construction of the system, but to observe the effects which it produces from year to year on the health of the people who live near the irrigation grounds. This Commission is to be permanent, and is to consist of five experts, one nominated by the Minister of Agriculture; one by the General Council of the Seine; one by the General Council of the Department of Seine and Oise, and a fourth by the Minister of Finance, while the fifth is chosen by the Committee of Hygiene, or, as we should call it, the National Board of Health, of France. Each of these experts represents and defends a different interest, and no measure prejudicial to the public health, or the public finances, is likely to receive the votes of a majority of the Commission. Every year the members of the Commission are required to unite in a report to the Minister of Agriculture, which is accompanied by one to the Minister of Finance.

AN artificial silk has been invented by M. Duvivier. The substance of the new fibre consists of gun-cotton, mixed with gelatine, and dissolved in strong acetic acid. This mixture is placed in a receptacle having a small orifice at the bottom, and the drop which exudes is taken up and drawn out, forming a silk-like thread. This is passed through three baths, the nature of which is not described, and is then dried. When dry it is wound on bobbins, or in skeins, which are kept in water. The color of the thread is a pale brownish yellow, and it has been successfully woven into cloth. On the whole, the new material does not seem likely to come into very fierce competition with silk. The strength of the real silk fibre is so far beyond that of any imitation yet invented that it must continue to be preferred to any artificial product, unless, possibly, some sort of glass should be devised tenacious enough to go through the ordeal of spinning and weaving.

THE *Deutsche Bauzeitung* gives some particulars in regard to the new railroad which is to cross the South American Continent, from the Atlantic Ocean at Buenos Ayres to the Pacific at Valparaiso. The greater part of the road has already been built, but the mountain section, about one hundred and fifty miles long, between Mendoza, on the side of the Argentine Republic, and Santa Rosa, on the Chili side, still remains to be completed. At Mendoza, the elevation of the present road above the sea is about twenty-five hundred feet, but in a length of one hundred and twenty-four miles the new line ascends to a height of nearly ten thousand feet. The summit is formed by a tunnel, about seven miles long, from which a descent of seven thousand feet, in a length of thirty-two miles, leads to Santa Rosa, where connection is made with the existing road to Valparaiso. It is expected that the line will be finished by the end of 1890, with the exception of the tunnel, which will take two years longer. During the construction of the tunnel, however, the road will be open for traffic, passengers and goods being transferred over the mountain pass.

AN "idea-competition" is just announced in Switzerland for a National Museum in Berne. The competition is open only to Swiss architects, who are invited to send sketches, at a scale of one to two hundred, for the elevations, as we suppose, and one to five hundred, which we imagine must be for the plans. Although the drawings will thus be very small, fourteen hundred dollars is offered in prizes, and a most imposing array of judges has been appointed, comprising Professors Auer, of Berne, and Bluntschli, of Zurich, Colonel de Saussure, of Geneva, and three well-known architects, together with Dr. von Essenwein, Director of the Germanic Museum in Nuremburg.

BUILDERS' HARDWARE.[1]—XXVII.

CLOSET-FITTINGS.

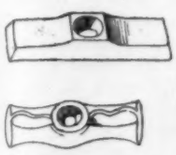


Fig. 393.

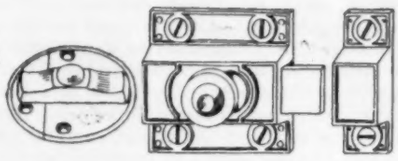


Fig. 394. Turn-buttons. Fig. 395.

SOME of the appliances included under the title of Closet-Fittings, appertain perhaps more truly to furniture than to Builders' hardware, though they are sometimes used in connection with the finished carpenter work. The designation of closet-fittings is a somewhat arbitrary one and while not strictly applying to everything considered under this classification, might include many of the articles described in previous chapters. The limitations will, however, be sufficiently exact for the present purpose.

The simplest appliance for securing the door of a cupboard is what is known as a turn-button. Figure 393 illustrates the cheapest form, consisting of a metal-bar or button which is secured in place by a screw through the centre, the screw being turned in so as to allow the button to rotate freely. An improvement is to have the button pivoted on a plate which is screwed independently to the door-frame, Figure 394, while a plate is secured to the door for the button to turn upon, or *vice versa*.

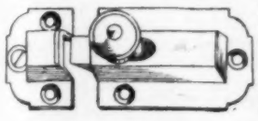


Fig. 396. Cupboard-catch.

A turn-button acts as a bolt, but it is often preferable to use some other form. Any of the flush, sunk, raised, mortise or neck bolts described in a previous chapter will answer for a cupboard, though there are a few styles which are especially designated as cupboard-bolts. Figure 395 is an example. Again, it is often desirable to have a spring-catch on a cupboard, such as that shown by Figure 396, which may be considered as a type of many different styles. Figure 397 shows a lever-cupboard catch, which works by gravity, without springs, the catch being released by raising the handle. Each of these varieties can be used for double or single doors, though with double-doors some form of bolt is necessary in addition. The book-case bolts and catches described in the chapter on bolts might properly be included, also, in the present category.

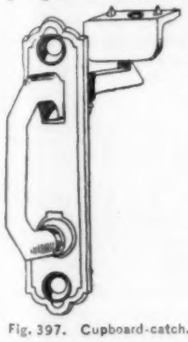


Fig. 397. Cupboard-catch.

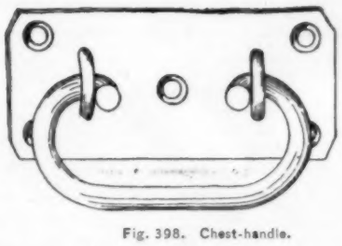


Fig. 398. Chest-handle.

Drawer-pulls are made in a great variety of styles, only a few of which need be considered here. Figure 398 is a cheap and very common form of wrought-iron chest or drawer handle, suitable only for rough work. Figure 399 is a very serviceable drawer-pull, and in plainer form, with sides as well as front rounded in, is what is commonly employed for china-closets, wardrobes, etc. Figures 400 and 401 are drop-handles for nice work on the same principle as the first pull illustrated. The latter is a very old pattern, such as is found on most of the antique colonial wardrobes and dressing-cases, and is just now quite in fashion. Figure 402 is a straight bar-pull and Figure 403 is a serviceable and easily attached ring drawer-pull occasionally employed for wardrobes. Figure 404 is a type of what is particularly designated as a druggist drawer-pull, being

Fig. 399.

Fig. 401.

Fig. 400. Drawer-pulls.

on the principle of Figure 399 but with frame and slot on the face to receive a card or label.

Drawer-knobs are mostly too simple to require any illustration. They are made with heads of wood, porcelain, mineral, composition or metal, and are usually so shaped as to dispense with a separate shank or spindle, the knob sometimes having a slight metal rose or collar. In the cheaper grades the knob has leaded into it a gimlet-pointed screw-threaded spindle which can be turned directly into the drawer-front; but a more satisfactory form has a spindle extending entirely through the drawer, and secured by a nut and washer on the inside. With a wooden knob the attachment is sometimes made by means of a screw passing through the drawer-front and turning into the knob from behind. Wood or porcelain knobs are most suitable for kitchen and china closet work, though no knob is ever as permanent or satisfactory as a drawer-pull.

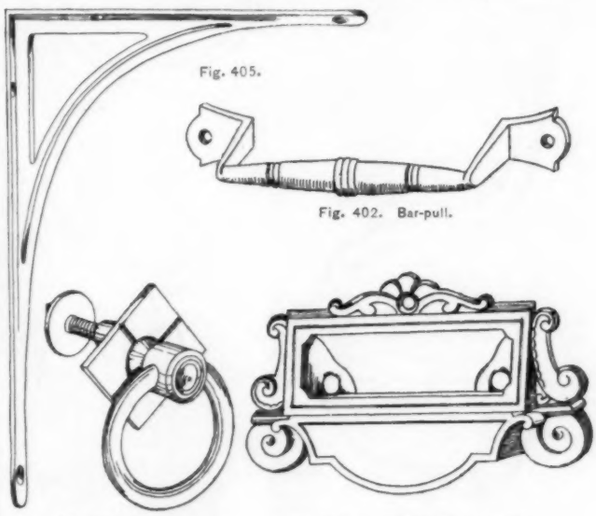


Fig. 405.

Fig. 402. Bar-pull.

Fig. 403. Ring-pull.

Fig. 404. Druggists' Drawer-pull.

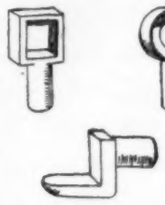


Fig. 406. Bookcase Shelf-pegs.

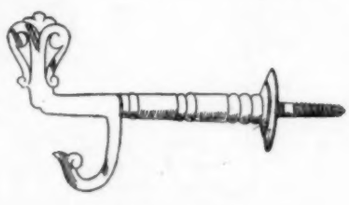


Fig. 407. Coat-hook.

Figure 405 illustrates the ordinary shelf-brackets. They are cast in malleable-iron in sixteen or more sizes varying from 3 x 4 inches to 16 x 20 inches. The form is a very strong one, and a great deal of stiffness is obtained with a minumum of metal. They usually fail, when overloaded, by the upper arm or flange breaking near the inner screw-holes, but it requires a greater load than one would suppose to break such a bracket.

[1] Continued from No. 699, page 233.

In the chapter on knobs, the writer omitted to notice a very simple and effective form of screwless knob-fastening, recently put on the market by the Hopkins & Dickinson Manufacturing Company. In this device, the spindle, which is cut with a screw-thread, is rigidly attached to the shank and the knob on one side. The opposite shank has a swivel-connection with the knob, and is threaded inside to screw over the spindle. In application, the loose shank is screwed onto the spindle until two dogs or teeth on the inner end of the shank are engaged in slots in the rose. The rose, which projects somewhat from the face of the door and has a milled-edge, then serves as a set-screw, drawing the two shanks together and binding against a washer on the door, so that while the knobs can be rotated freely, the rose-washer and consequently the shanks, will not work loose.

There are many so-called "fancy" forms of shelf-brackets in the market few of which are in the slightest degree artistic, though most of them are stronger than the simple form shown by the figure, on account of having more metal-work between

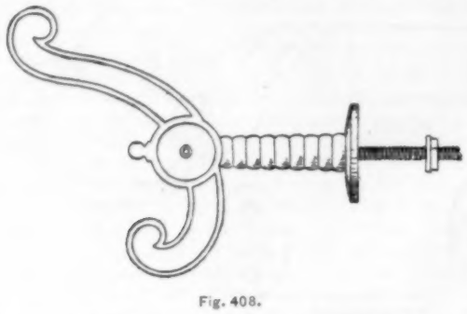


Fig. 408.

the flanges. Brass brackets are seldom required for ordinary house work and can usually be had only on a special order.

It is often desirable, in fitting up book-cases or china-closets, to have movable shelves. Shelf-pins of some sort are then

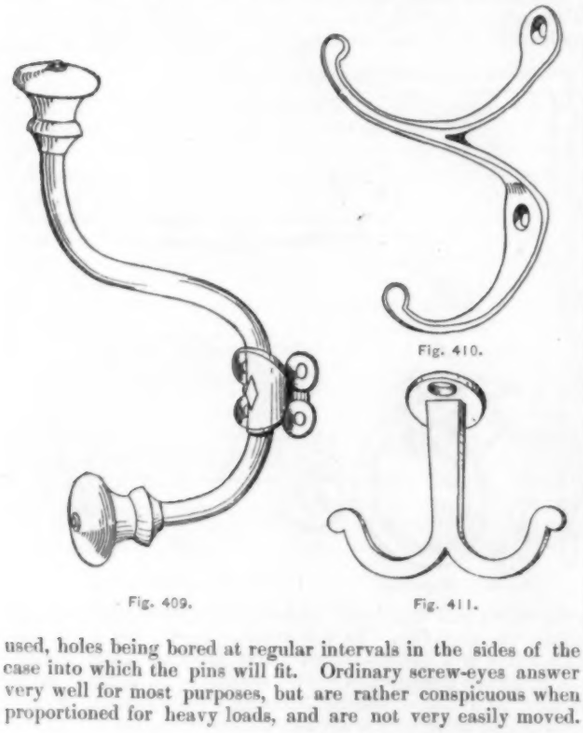


Fig. 409.

Fig. 410.

Fig. 411.

used, holes being bored at regular intervals in the sides of the case into which the pins will fit. Ordinary screw-eyes answer very well for most purposes, but are rather conspicuous when proportioned for heavy loads, and are not very easily moved.

Fig. 413.

Fig. 412.

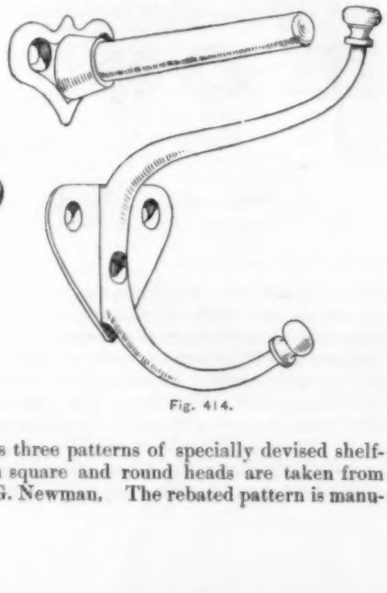


Fig. 414.

Figure 406 illustrates three patterns of specially devised shelf-pins. The ones with square and round heads are taken from the catalogue of A. G. Newman. The rebated pattern is manufactured by Russell & Irwin, and holds the shelf so that the greater portion of the pin is hidden.

Closet-hooks are made in so many different styles, and, withal, are so well-known that only a few forms need be considered, which will serve as types for three hundred or more varieties to be found in the hardware market. The hooks are invariably secured to wooden cleats which are nailed to the wall over the plaster. Figure 407 is a hat-pin with hook beneath, which can be turned directly into the wood by means of the screw-thread on the extension of the shank. Figure 408 is held by a nut turned up from behind, and can, of course, be used only on some form of hat-rack. This and the preceding are properly furniture-trimmings. Figure 409 is a familiar, old-fashioned coat-and-hat hook with porcelain knobs, a very serviceable article even though it is not quite in style. Figure 410 is a form of wardrobe hook usually made in brass or bronze, and Figure 411 is a wardrobe hook intended for dresses which are to hang from the ceiling. A similar hook, Figure 412, is fitted with a gimlet-pointed screw-shank, to screw directly into the wood. A very good wooden hook, Figure 413, is made on the same principle as a harness hook, the hardwood pin being inserted from the rear of the iron-base and bevelled, so it cannot work loose or pull out. Figures 414 and 415 are types

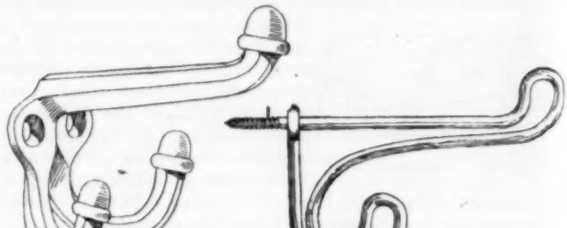


Fig. 415.

Fig. 416.

of the common hat and coat hook, the latter being specially designated as for school use. Several styles of hooks are also made of bent steel wire, Figure 416, and are very strong, light and serviceable.

All of the foregoing closet fixtures can be had in various sizes and in different materials. The following table gives some average retail prices which will serve as guides in selecting goods. The prices are for a dozen medium-sized fixtures, complete, with screws.

Table of Closet-Fixtures.

Fig.	Fixture.	Bronze.	Japanned Iron.	Bronzed Iron.	Wood.	Porcelain.
393	Turn-buttons, without plate, 1½ in.	$ .33	$ .10	$ .20	$	$
394	" " with plate, 1½ in.	.87	.65	.75	—	—
395	Cupboard-bolts.	2.25	—	.87	—	—
396	" catches	3.00	—	.65	—	—
397	Lever cupboard-catches	3.25	—	.75	—	—
398	Chest-handles, wrought	—	1.35	—	—	—
399	Drawer-pulls, plain	2.00	.25	.38	—	—
400	Lifting-handles, 3½ in. single swing	2.25	.75	1.25	—	—
401	Draw-handles	4.00	—	—	—	—
402	Bar-pulls, 4½ in.	2.00	—	.30	—	—
403	Ring-pulls	1.50	—	—	—	—
—	Druggist-pulls, plain	4.50	—	1.50	—	—
—	Drawer-knobs, screw end	2.50	—	—	.15	.35
—	" " bolt and nut	2.65	—	—	.30	.50
405	Shelf-brackets, 8 x 10, per doz. pairs.	—	3.00	4.00	—	—
406	Shelf-pins.	1.25	.08	.50	—	—
—	Ordinary coat and hat hooks.	2.50	.20	.25	—	—
413	Wooden " " " "	—	—	—	.25	—
416	Wire " " " "	—	.20	.25	—	—

[To be continued.]

EQUESTRIAN MONUMENTS.[1] — XVI.

THE CONDOTTIERI. — III.

Medal by Le Pisanello in Commemoration of the Taking of Rocca Contrada.

THE successor of Carmagnola, the successful adversary of Piccinino, the contemporary of Sforza, Alfonso the Magnanimous, Federigo of Urbino and of Sigismondo Pandolfo Malatesta, Bartolomeo Colleoni, to have achieved the success and final fame that befel him, must have been — well, worthy of all the praise that has been showered upon him as a soldier and as a man.

Born of a noble family of Bergamo, Bartolomeo in his early childhood was a victim of one of the family intrigues common to those times, through which his father was slain by sundry cousins with whom he had allied himself, but who sought their own advancement by killing him and seizing his possessions. After a short stay in prison, Bartolomeo was allowed to escape and live with his mother in obscure poverty till he was of age to shift for himself. This he did by first taking service as a page in the retinue of the Lord of Piacenza; but at the age of twenty, having meanwhile taken advantage of all opportunities to attain skill and address in the use of arms, he finally took up the profession of the roving soldier, selling his service here or there where he could obtain most pay. His first real step was procuring the command of twenty men-at-arms in reward for having deserted the army of the *condottiere* Braccio to take service against him in the army of Queen Joan. When peace was finally declared he sought employment in the armies of Venice under Carmagnola in the campaign against Filippo Maria Visconti, and after Carmagnola's recall and judicial murder by the Seignory of Venice he continued in service under Gattamelata, who had succeeded to the chief command, and was waging the Republic's battle against the famous Piccinino. In these years, between 1432 and 1443, his command had been increased as he approved himself trusty and successful soldier till he was the leader of eight hundred men-at-arms, and at the death of Gattamelata in 1440 he was practically the most prominent general in Venetian employ. Further advance was, however, checked by a quarrel in 1443 with the ruling doge, and Bartolomeo, in consequence, took service with Filippo Maria Visconti, who finally, becoming jealous of the ascendancy he was obviously acquiring, threw him into prison. Filippo's death within two years caused Bartolomeo's release, and he took advantage of the temporary confusion to seize his patrimony of Bergamo in 1447. From this time to 1455 he was particularly active in changing his paymasters, twice serving the Venetians before, in 1455, he was elected commander-in-chief of the Venetian forces, with a salary of 100,000 florins. In this interval all his changes had tended to increase both his wealth and his personal importance. From this time to his death, in 1475, he held practically the most important position in all Italy, and it is conclusive evidence of the ability and unquestioned probity of the man that so jealous an employer as the great Venetian Republic should have for so long a term left in his hands the practically unqualified control of its great armies; and he himself freely expressed surprise that he was able to maintain his ascendancy, and in his declining years besought the Seignory never again to entrust so great power to a single man.

Bartolomeo Colleoni, Venice. Verrochio and Leopardi, Sculptors. After an Etching by Unger.

More soldier than cultivated man of letters, he yet felt the movement of the times, and followed the example of others in becoming the patron of men of learning and practisers of the arts. Particularly was he fond of building, and it is less a wonder that potentates of that age, who, themselves, had no education in such matters, should have interested themselves in building than that any should have been found willing to foster the arts of painting and sculpture. In bricks and mortar the self-made leader of those days may have felt that he had to deal with substances that he knew something about, and could understand that a certain height and bigness would produce the imposing effect he aimed at, though he may have been as innocent of all appreciation of proportion as of the justness of the meter used by the poet who celebrated his success in battle. Be this as it may, it is to the whims of such men that are to be credited many of the valued architectural monuments of Italy to-day, and Colleoni, moved by whatever motive, delighted in building, and building of a useful rather than an ornamental character. A man of unusual depth of religious feeling, he felt it his duty to use his great wealth largely in the service of the Church, and accordingly built several churches and monasteries, and founded not a few endowed charitable institutions and hospitals, besides doing the duty of an enlightened ruler in providing the towns under his rule with good water, strong walls and other municipal conveniences. Naturally, Bergamo, his native town, benefited most by his care, and here he built, or rather reconstructed, the former Sacristy of S. Maria Maggiore, so that it might become the mortuary chapel of his family, and it is now known as the Capella Colleoni. It is said that in spite of his general loyalty to the Church, the Consiglio della Miserecordia disliked and resisted his desire to sequestrate this portion of their belongings to serve for the aggrandizement of himself and his posterity, and that, in consequence, he had to use force to secure possession of it. Here, opposite the doorway, stands the rich and elaborate tomb of the great *condottiere*, surmounted by an equestrian statue in gilded wood, which was voted to his memory by the town of Bergamo, and was entrusted to the hands of two German sculptors, named Sistofiglio di Enrico Tigri da Norimberga and Leonardo Tedesco. The tomb itself is a costly but not very pleasing piece of work by Giovanni Antonio Omodeo, who expended 50,000 gold florins upon it.

Colleoni sought to perpetuate his name and fame not only in his native town but also in a somewhat audacious way at Venice, the scene of his latest and greatest glory. At his death in 1475, it was discovered that he had bequeathed to the Venetian Republic the greater part of his wealth — more than 100,000 ducats — on the condition that a statue should be erected in his honor on the Piazza of S. Mark where, as perhaps he knew, the law forbade that any statue should be placed. Municipal pettifogging found a way to secure the inheritance by complying with the letter of the testament, and the wily counsellors construed it that the square in front of the School of S. Mark was the place intended, and there they erected the most impressive equestrian monument that the world now contains. Burkhardt states that the Republic benefited by Colleoni's death because it confiscated his property, but this seems to be unlikely in the face of the subsequent erection of the statue, since such frugal-minded rulers would hardly have squandered a portion of their gain by devoting it to the glorification of its last possessor.

It is not possible here to examine into the discussion concerning what portions of the monument were due to Verrochio and to Leopardi, the two sculptors whose names have gained about equal glory from being associated with the work. The commission was first entrusted to Verrochio and he had probably carried his work on the model a long way toward completion before there came to his jealous ears a rumor that the work was to be taken from him and assigned to a pupil of Donatello's, one Vellano of Padua. Being a man at once self-respecting and quick of temper, Verrochio forthwith smashed the clay model of the group on which he had labored so long and at once left the city. The angry city fathers passed an

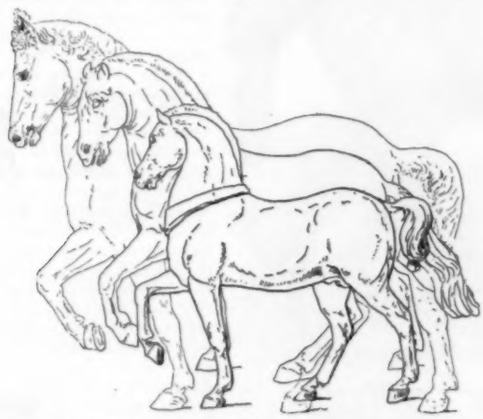
[1] Continued from No. 697, page 211.

edict of eternal banishment against him and declared his life forfeit in case he should ever again put foot on Venetian territory. Verrochio took his fate coolly and remarked to the herald who brought him the sentence of banishment, that even if the Republic did cut off his head it would not enable any one else to put a head on Colleoni's horse. This homely truth germinated slowly and bore fruit, for after the lapse of eight years the sentence of banishment was revoked and the sculptor was promised not only immunity but double pay if he would return to Venice and resume his work. Return he did and went to work, but it was too late; nature was fatigued or the current of artistic ideas was checked and before he was able to bring the group once more into shape, death put an end to his labor. Just how much he had accomplished is a matter of dispute between the learned in matters of art, and it is not desirable here to go into the discussion. It is apparently safe to assume that even if his early sketches determined the final character of the group he

Head of Bartolomeo Colleoni. From *L'Art.*

succeeded in bringing the horse only anywhere near to completion at its present size. It was Verrochio's desire, and so expressed in his will, that his pupil Lorenzo di Credi should go on with the work, but the authorities decided differently and awarded the task to Leopardi, a Venetian sculptor. The petulent temper of the Venetian rulers was continually bringing them into positions where they had to eat humble-pie or retract their own words, and in order that the work might go on it was first necessary to remit Leopardi's sentence of banishment, laid upon him because found guilty of forgery.

To Leopardi is due the figure of the rider, the pedestal, probably some of the trappings of the horse, and perhaps he it was who by some subtile changes endowed the animal with a closer approximation to animation than any other sculptor has ever achieved. The vitality of the composition, its reality so to speak, make this monument the



The Horses of Colleoni, Gattamelata and one of the Bronze Horses of Venice.

standard of excellence with which all equestrian sculpture — of greater age as well as of less — may be compared. It is the ideal, the almost unapproachable rendering of the truthful conception of an artistic monument. Here are a man and a horse each having the attributes that belong to the living animal, while in addition the master has endowed them with the very essence of monumentality, each having character enough to make, if separated, a remarkable piece of sculpture while, allied, the superiority to all other compositions is a fact of whose infallibility the observer is more impressed each time he brings into comparison with the group some other monument which ranks high as an artistic success. To select for favorable comparison with this masterpiece of the Renaissance period the often-derided equestrian group of Joan of Arc, by Fremiet, in the Place des Pyramides in Paris, will probably cause many to feel that praise of the modern work is an injudicious way to enforce the applause awarded to the elder monument. But as the Venetian monument reveals a real man and a real horse, so the Parisian group presents a real horse bestridden by a real woman. In both cases the sculptor's conception of his subject's character is competently rendered. The fiery impetuosity of youth merged in the sedate impassiveness of mature age is adequately declared at Venice just as the emotional impulse of inspired girlhood is shown at Paris. The remorseless doggedness of the onward movement of Colleoni's horse befits the character of his rider as the most irresisti-

Roman Cavalier by Verrochio. A Statuette in a Collection at Genoa. From *L'Art.*

ble and impressive figure of his day, just as the great Norman horse which bears the Maid of Orleans adds to her femininity the needed element of force by suggesting successful accomplishment of her purpose through the introduction of an element of weight and strength. Moreover both riders are riding as such riders should, the girl raising herself in her stirrups in her excitement and depending on them for support as a woman naturally would when she found herself for the first time seated astride, while the man rides as only the perfect horseman can ride. Nothing can surpass the magnificent action of

Gattamelata, Padua. Donatello, Sculptor.

Colleoni's body, rigid from knee to hip but above that point yielding to every motion of his steed so as to ease the animal in every possible way and prevent saddle galls. In the whole range of equestrian sculpture there are few riders who have such a seat as this, few who look as if horseback riding were an everyday affair and not a mere matter of picture-making. Usually the sculptor places a forked biped upon the back of a quadruped and makes a union between them by means of saddle and stirrup-leathers, but there are few besides Leopardi who seem to have conceived that it was possible for a man to keep his seat without the aid of the harness-maker.

The monument was unveiled in March, 1496, and Leopardi, the survivor, was showered with applause for the manner in which the work had been finished.

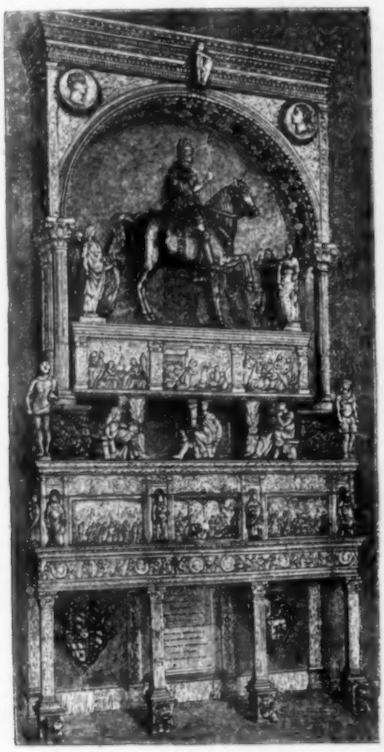
Those who seek to award to Leopardi the largest share of this successful work do so by belittling Verrochio, declaring that he knew little about the making of an equestrian statue, had few models to study, and had made no previous essays in this line of work. The existence in a private collection at Genoa of an equestrian statuette ascribed with seeming reasonableness to Verrochio may be taken as evidence that at some time in his career he had given attention to equestrian sculpture, and the animation of this little group is not so dissimilar in kind from that which inspires the Colleoni group as to lead one to put too great faith in the assertion that it was Leopardi's genius alone that saved the monument at Venice from being merely commonplace. The statement that Verrochio was greatly indebted to his study of Donatello's equestrian statue of Gattamelata at Padua is not improbable, and there is no reason why Verrochio should not have been eagerly willing to consult the work of a master whom he must have been ready to acknowledge as his superior.

Properly speaking, the monument at Padua should be considered

among the earliest of the *condottiere* monuments, not only in point of date but because of its intrinsic merit and the renown of the artist who made it.

The son of a baker, Erasmo (or Stephano or Franceso) da Narni, nicknamed Gattamelata, achieved greatness in true *condottiere* fashion — through personal prowess and the perception of how and when to take advantage of the opportunities that the perpetual warfare of the times threw in his way. While still a young man, he was made commander-in-chief of the Venetian forces in their war with the Milanese, and in that position contended successfully with such great leaders as Ludovico Sforza and Piccinino. At his death, in 1443, his son determined to erect a statue to his memory, and assigned the task to Donatello, who seems to have preferred to devote himself to glorifying an Italian leader, rather than to perform the same service for Alphonso of Aragon, who about the same time sought to have him execute a similar monument to commemorate his capture of Naples in 1442.

The difficulties in the way of Donatello were not a few, since, first, equestrian sculpture was for him an untried field of art, and there were at that time few statues of the kind in Italy, and the means of getting at them were lacking, partly because of the imperfect means of communication, and partly because it was not possible to visit at will what might be at the time hostile territory; and, in the second place, it was an unusual thing to undertake the casting in bronze of so large a statue. What is thought to be the wooden model of one of his full-size studies for the horse is still preserved in the Palazzo della Ragione at Padua, which, at a later day, was used in some civic festivity to bear an effigy of Jupiter in procession. Not unnaturally, the horse shows traces of being inspired by the horse of Marcus Aurelius at Rome, and the bronze horses of St. Mark's. Indeed, there is a very perceptible family likeness between the horses of St. Mark's and those which bear Marcus Aurelius at Rome, Gattamelata at Padua, Colleoni at Venice, Cosmo de' Medici at Florence and Henri IV at Paris; and no less can be said of the horse, as indicated by his drawings, which Leonardo da Vinci hoped to execute for his statue of Ludovico Sforza. There is a sedate propriety of air about all these beasts, as if they felt that not only they must represent worthily the character of the steeds habitually used by their masters in daily life, but that also their deportment must lend an added dignity to a memorial that was erected not for a day, but for all time. Place one of these sturdy, if slightly heavy, horses by the side of some of the light-limbed, capering chargers or circus trick-horses which are modelled for the statues of the present day, and one receives a useful object-lesson in the value of mere static force as an element in producing a satisfactory result — an element as useful to observe in sculpture as in architecture. In short, it is the *monumental*, not the merely pictorial, statues that best stand the test of time.



Sepulchral Monument of Colleoni, Bergamo. From the *Art Journal*.

Donatello was employed about nine years in the execution of this monument — think of it, you American makers of soldiers' monuments! — and the monument was finished in 1453.

Donatello. — Donato di Niccolo di Betto Bardi, called Donatello, was born in Florence in 1386. His most noted works are a statue of David in the Bargello; one of St. Mark and one of St. George, both on the exterior of Or San Michele; a monument to Pope John XXIII in the Baptistery at Florence; the reliefs of dancing children, in the Uffizi; the external pulpit of the cathedral at Prato; and the group of Judith and Holofernes in the Loggia de' Lanzi at Florence. He was much honored and assisted by Cosimo and Piero de' Medici. He died in 1468 and was buried in the Church of San Lorenzo, at Florence.

Verrochio. — Andrea Cione di Michele, called Verrochio. Born in Florence, 1432. Apprenticed to Giuliano Verrochio, a goldsmith, from whom he took the name of Verrochio, which he has been generally said to have acquired on account of his wonderful correctness of eye. Teacher of Leonardo da Vinci. Died in Venice, 1488. Principal works — Incredulity of St. Thomas; David; Boy and Dolphin; Monument to Piero and Giovanni de' Medici and Tomb of Salvaggia Tornabuoni.

(To be continued.)

The Illustrations

[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

THE CATHEDRAL AND THE STATUE OF GATTAMELATA, PADUA, ITALY,

[Gelatine Print, issued only with the Imperial Edition.]

"THE church of San Antonio is understood to be the work of Nicolo Pisano, designed in 1237, begun in 1259 and finished in the main in 1307 though parts were not built till 1475. A conflagration caused its very complete restoration in 1749. The building measures 280 feet in length, 138 feet across the transepts and is 116 feet high. "St. Antonio has no less than eight cupolas, which, together with the two lofty octagonal bell-turrets, give the building a thoroughly Eastern appearance. As seen from the northeast, the grouping of the domes and turrets is very picturesque, its great size and variety of outline giving it a peculiar and novel grandeur; pointed and round arches are used boldly together, the walls are everywhere panelled, and there are great varieties of brick corbel courses. The detail on the whole of this striking building is meagre and disappointing, the color of the red brick is too light, and stone is but sparely used. The church was completed in 1307, with the exception of the cupola over the choir, which was not added till 1424."

COMPETITIVE DESIGN FOR CHURCH, CLERGY-HOUSE AND SCHOOLS FOR TRINITY CORPORATION, NEW YORK, N. Y. MR. F. C. WITHERS, ARCHITECT, NEW YORK, N. Y.

In order that the main entrance should be as near as possible to the Ninety-third Street station of the Elevated Railroad, a tower, 26 feet square, has been placed at the northeast corner of the lot, to serve as a porch. This porch leads directly into a large lobby, capable of accommodating 150 people. From this lobby the main body of the church is reached by three doorways, one facing the centre of the nave, and the others the passages in the aisles. Seats, all of which face the altar, are provided on this floor for 1,206 people, including the movable benches in the centre passage, which is 11 feet wide. Galleries, which are arranged in the nave over the lobby and in each of the transepts, will accommodate a total of 252 persons. The galleries in the transepts are set back so as not to interfere with the view through the arches at the end of the aisles. Each of the galleries has its separate staircase. In the chancel are stalls for 62 choristers and clergy, and, as its width is great (38 feet), a passage is made behind the stalls on either side of the exit of communicants through an opening on each side of the chancel-arch.

Ample exits from the church are provided, there being, besides those into the lobby, a porch in each of the transepts, a separate entrance for the choristers on the south side, near to the robing-room, and the clergy would have a separate entrance on the west, for the convenience of the clergyman in charge.

The "Chapel for Daily Prayer" runs parallel to, and is of the same length as the chancel, and has a separate entrance to it from a porch on Ninety-second Street. It will accommodate 161 worshippers, and can be thrown open and made a part of the church in case of great crowds.

A detached house, containing about 1,400 square feet, is provided for the clergyman in charge, on the northwest corner of the lot. This location is the most desirable, as being near the chancel, and more private than if connected with the other buildings, with the advantage also of having three sides open to the light and air. The house for the rector (when needed) containing about 2,000 square feet on a floor, is located on the southwest corner.

The building for the Sunday-school, etc., containing over 4,000 square feet, adjoins the church on the southeast corner of the lot, having its principal entrance on Ninety-first Street. The plan provides a large room, 60 feet by 30 feet, on the ground-floor for the parish school. A room for the Sunday-school, 67 feet 6 inches by 30 feet 0 inches, with a smaller one (25 feet by 18 feet) adjoining it for the infant-class, is arranged on the second floor, having direct communication with the gallery over the lobby in nave. The principal staircase would lead direct to a large hall in the third story, of the same size as the room below it.

Well-lighted rooms for class-rooms, or for the guilds and societies can be arranged in the basement of this building, with an outer entrance on Ninety-first Street, and a staircase to the ground-floor above.

On the west side of this building a private entrance from the

churchyard leads to the rooms provided for the junior clergy, viz., three sitting-rooms with bed-rooms attached, a general parlor on the first floor and a dining-room on the second floor, with pantries, bath-room, etc. The sexton's rooms will be found on the third floor, with a lift from the basement for hoisting supplies, and another to the butler's pantry on the floor below. Doorways are provided for direct communication with the main hallways of school, hall, etc., on each floor.

The walls of the church, etc., are designed to be built of rock-faced ashlar laid in random courses, Schenectady or North River bluestone being recommended for this purpose, with dressings of either Belleville, N. J., sandstone, or Indiana limestone.

The church floor would rest on iron beams with fireproof arches. Hollow tile would be used for furring and partitions, and the staircases of school building would be fireproof, enclosed with brick walls.

The church and adjoining buildings would be lighted by electricity, and warmed by steam generated in a separate boiler-house, which is located in a central position, with access to it from the street by a cartway, and so placed in an enclosed yard as to be hidden from view.

There would be a basement under the whole of the church, and, if desired, the western end, which is the highest out of the ground, can be finished off for guild rooms or other purposes, access to which would be by a staircase from the cloister, as well as from the church yard.

The style of the church is that known as Gothic of the "Early English" period.

It is estimated that the church, chapel, and adjoining buildings, can be well and substantially built for $325,000.

A ground plan of the rectory is given, but the building is not included in the above estimate.

MONUMENT TO BARTOLOMEO COLLEONI. VERROCHIO AND LEOPARDI, SCULPTORS. THE SCHOOL OF ST. MARK AND THE CHURCH OF SS. GIOVANNI E PAOLO. VENICE, ITALY.

SEE article on "Equestrian Monuments," elsewhere in this issue. A larger illustration of the equestrian portion of this monument may be found in the *American Architect* for April 25, 1885.

WOODEN MODEL OF HORSE FOR GATTAMELATA'S MONUMENT AT PADUA. DONATELLO, SCULPTOR.

SEE article on "Equestrian Monuments," elsewhere in this issue.

HOUSE BUILT BY JOHN BARTRAM IN 1730 AT GREY'S FERRY, PHILADELPHIA, PA. SKETCHED BY MR. FRANK HAYS, PHILADELPHIA, PA.

SCIENCE HALL, RANDOLPH MACON COLLEGE, ASHLAND, VA. MR. W. M. POINDEXTER, WASHINGTON, D. C., ARCHITECT.

THE NICARAGUA CANAL ROUTE.

ON the 30th of November, 1887, an expedition sailed from New York aboard the steamship "*Hondo*" to survey and locate the route of an interoceanic canal across the territory of the Republic of Nicaragua. The party included a correspondent of *The Times*, through whom our readers were informed, from time to time, of the welfare and progress of the expedition until the completion of the main features of the survey, in July, 1888. Most of the surveyors and draughtsmen returned home about that time, but several of the party remained in Nicaragua, and have since been employed in perfecting details and making more elaborate surveys and investigations with reference to certain important parts of the contemplated work.

In the meantime a charter has been granted by the United States Government to the Maritime Canal Company of Nicaragua, certain important diplomatic questions have been satisfactorily arranged, the work of the survey expedition has been elaborated, and preparations are now completed for dispatching men and materials to reinforce the party who have remained in the field, and for beginning the construction of the canal which, it is hoped, will in a few years connect the Atlantic Ocean with the Pacific, and revolutionize the trade routes of the world.

The central portion of Nicaragua, from north to south, is occupied by the main Cordillera of the Isthmus, which is here greatly reduced in altitude, and consists merely of a confused mass of peaks and ridges of an average elevation of about one thousand feet. Between this mountainous region and the shore of the Caribbean Sea stretches a low, level country, covered with a dense forest. West of the mountain zone is a broad valley, about one hundred and twenty-five feet above the level of the sea, extending from the Gulf of Fonseca southeasterly to the boundary of Costa Rica. The greater part of this valley is occupied by the two lakes, Managua and Nicaragua, the latter 110 miles long and from 50 to 60 wide — an inland sea twice as large as Long Island Sound. Between these lakes and the Pacific Ocean is a narrow strip of land, varying from twelve to thirty miles in width. The drainage of the lakes and the entire valley around them passes through the San Juan River, and discharges into the Caribbean Sea at Greytown.

The lowest pass across the backbone of the New World from Behring Straits to the Straits of Magellan is up the valley of the San Juan and across the Lajas-Rio Grande "divide," between Lake Nicaragua and the Pacific.

The eastern section of the proposed canal, from Greytown to the first lock, a distance of ten miles, is entirely in sand and soft clay, and the surface elevation varies from three to twenty feet above the sea-level. In this section the line of the canal cuts the small streams San Juanillo and Deseado each twice, and these streams and the shallow lagoon Benard are to be diverted into new channels, easily dredged through the alluvial soil. The forest growth along this section, especially in the six or seven miles nearest the sea, is dense, but of the kind peculiar to low, swampy regions, consisting of low palms, with small roots penetrating the ground loosely and slightly. The borings do not show any sunken logs or tree-trunks buried in the alluvial deposits.

The first lock has a lift of 31 feet, and from it to the second lock, 7,620 feet, the cutting is still in clay and sand. The average elevation of the surface is about the level of the water in the canal; in some places it is lower, and some lateral embankments will be necessary. The prism of the canal in these two sections is 120 feet on the bottom, 30 feet depth, 210 feet surface width, side slopes, 1½ to 1, and area of water prism, 4,950 square feet. Lock 2 is founded upon and partially excavated in bed-rock. Its lift is 30 feet.

From this to the summit lock, a distance of 2,570 feet, the excavation will be entirely in clay and sand. A small amount of lateral embankment will be required. Lock 3 will be almost wholly excavated in the bed-rock near the end of the mountain spur which forms the eastern boundary of the creek Josephina, a considerable tributary of the Deseado from the north. From the point of this spur south of the lock a dam 77 feet high and 820 feet long on the crest, thrown across the Valley of the Deseado to a high hill on the south side, will impound and raise the water in the upper valley of the Deseado to an elevation of 106 feet above sea-level. The basin thus formed is about four miles long, nearly straight, 2,000 feet wide and 30 feet deep. The water-shed draining into it will be about 15 square miles.

At the western extremity of the Deseado Basin begins the "Deseado-San Francisco divide cut," 16,300 feet long, and of 147 feet average, and 333 maximum, depth. The material is almost entirely homogeneous trap-rock, covered to an average depth of 24 feet with clay soil. The canal prism is 80 feet on the surface, 80 feet on the bottom and 30 feet deep, and the sectional area, 2,400 square feet. The side slopes are in rock, ¼ to 1, and in earth, 1½ to 1.

From the western end of this cut to the mouth of the Caño Machado, which enters the San Juan three-and-one-half miles below the mouth of the San Carlos, is twelve-and-one-half miles along the located line of the canal. This portion of the canal is made up of a series of short cuts or sections, from 150 to 1,400 feet in length, alternating with basins formed by impounding the drainage of the San Francisco Valley by a series of embankments south of the canal line. The total length of the several cuts is 2.47 miles. The total length, on the crest, of embankments, walls and dams necessary to impound the drainage of the 65 square miles of watershed of the San Francisco Valley, and hold it up to the level of 106 feet above the sea, is 33,320 feet, sub-divided as follows: Masonry walls, 6,735 feet; embankments on firm ground, varying from 54 feet in height, 12,395 feet; embankments across swamps, varying from 50 to 67 feet in height, 14,190 feet. The prism of the canal through the cuts is 80 feet on the bottom, 184 feet on the surface, and 30 feet deep, with a sectional area of 3,673 square feet. The material to be excavated is almost entirely red clay, with a very small amount of rock.

Just below the mouth of the Caño Machana, between the two steep, rocky hills,-is the Ochoa Dam, across the San Juan River. The width of the river at this point is 1,133 feet, and its average depth at low stage is 6.6 feet. The dam will be 1,255 feet on the crest and 52 feet high. It will back up the water of the San Juan to Lake Nicaragua, a distance of 64 miles, and maintain the surface of the lake at an elevation of 110 feet above the sea. The upper San Juan will thus be converted into a lagoon-like extension of the lake. The width of the upper river at present varies from 420 to 1,300 feet, and its navigation at low stage is interrupted by five rapids. Raising the water by means of the dam will largely increase the river's width, and give a clear width of 30 feet over all the rapids except the upper, or Toro Rapids. Between these and the lake a

small amount of dredging and some submarine rock excavation will be necessary to obtain a thirty-foot channel.

From Fort San Carlos, at the head of the river, across the lake to the west side is 56½ miles, and for a distance of 13.7 miles out into the lake it will be necessary to dredge in soft mud, at some points 17 feet, to obtain a thirty-foot channel. The remainder of the lake is as free as the open sea. On the west side, the excavation will begin 1,400 feet from the shore, from which the canal will extend in a straight line up the valley of the Lajas and Guscoyol 3.7 miles. It will then curve across the flat divide, the crown of which is 41½ feet above the level of the lake, and 25,600 feet from the lake. From the divide the canal will pass down the valley of the brook Chocolata, and 8,600 feet west of the divide will enter the gorge of the Rio Grande, through which it will continue 13,300 feet to the eastern end of the Tola Basin, a total distance of nine miles. The prisms of the canal for this distance are: For 8,260 feet from the lake surface — width, 210 feet; bottom width, 120 feet; depth, 30 feet; area of water prisms, 4,950 square feet; for 26,000 feet through the divide, 80 feet width of surface, 80 feet bottom, 30 feet depth; area of water prism, 2,400 square feet; through the gorge of the Rio Grande — surface width, 184 feet; bottom, 80 feet; depth, 30 feet; area of water prism, 367,389 feet. The slope of the surface is gradual and regular. The bulk of the material is to be excavated in rock, which, throughout, is overlaid to a depth of 14 feet by varying strata of hard-pan, white and blue clay, and sand and black loam.

From the western end of the gorge of the Rio Grande to the head-gate of Lock No. 4, a distance of 29,000 feet, the line of the canal passes over the flat, gradually-inclined floor of the valley of the Rio Grande and the Rio Tola. A dam 2,020 feet long and 74 feet high across the gap through which the streams of this valley flow to the Pacific will impound the drainage of 83 square miles of country, and form a lake with a superficial area of a little more than six square miles, and a depth varying from 30 to 70 feet. The surface of this lake will be 110 feet above sea-level, the same level as the great lake itself. On the west side of the basin, and north of the dam, there will be a double lock with a combined lift of 85 feet, entirely excavated in the rock of the hills, and forming the northern abutment of the dam. The line of the canal through and from the double lock to the Pacific is straight.

Lock No. 6 is 8,355 feet from the tail gate of the double lock, the third and lowest lock of the Pacific flight, with a lift varying from 21 to 29 feet. The prism of the canal throughout this distance is 184 feet on the surface, 80 feet on the bottom, 30 feet deep, and area of water prism 3,673 square feet. Lock No. 6 drops the canal to the level of the Pacific, and from here to the Pacific high-water line, 6,000 feet, the material to be excavated consists entirely of recent alluvial and littoral deposits, sand, gravel, shells and mud.

To sum up: The total distance from the Atlantic to the Pacific by the Nicaragua route is, in round numbers, 170 miles, divided as follows:

	Miles.
Lake navigation	56½
River navigation	64
Basin navigation	20½
Actual canal only	29
Total	170

The summit level is 154 miles long.

It is estimated that thirty-two vessels can pass through any lock of the canal in one day. This allows forty-five minutes for each lockage. The estimated net tonnage per vessel is 1,750 tons, which are the figures for Suez in 1883. This gives a total annual tonnage of 20,000,000. It is believed, however, that the locks will be equal to forty-eight lockages a day for vessels of at least 2,000 tons. This would give an annual tonnage of 35,000,000.

The estimated cost of the canal is, in round numbers, $66,000,000, including a contingent sum of 25 per cent. These estimates include the electric-lighting of the canal, the lighting and buoying of the lake and the harbors, and railroads and telegraphs from the lake to the Pacific and from Greytown to the dam.

It is estimated by conservative authorities on the subject that the business of the canal will amount to from 5,000,000 to 6,000,000 tons in sight on the day it is opened. — *New York Times.*

BOOKS AND PAPERS.

IN looking over the first six numbers of this work,[1] I am inclined to question the correctness of the title. There is nothing of the real Japanese about it except the original motives or sketches. All else is French and German, and the illustrations, as they appear in the text and in the full-page illustrations, are French process-work — called engravings, — simply etched relief-plates, with some modifications in the more important examples.

The chief charm about Japanese art is the unaffected directness and frank simplicity in the way of handling of all the black-and-white work, and much of the reeds and grasses, flowers, etc.

There is a little stork on page 10, No. 2, that is made with three strokes of the brush, that gives one a vivid impression of the bird; and on one of the full-page plates in No. 3 we have three frogs made of metal, with jointed legs, like any other manikins, that are no end funny; but is this high art?

Running through the six numbers, we find little else than rough sketches — reproductions, mind, not the original "engravings" — in the text.

We are unable to see why the majority of these should be reproduced and placed before the Western mind with a distinct "stand and deliver" challenge for its admiration.

No one questions the superb work in bronze and *cloisonné*, which have been the charm of all fine collections of bric-à-brac, and which have brought liberal, not to say fancy, prices.

And, in a work of this high-sounding title, may we not look for a sample of fine arrangement in the construction of the pages?

There is hardly a page in the six numbers we have where the text illustrations do not run way over the type limit, and in many cases so far that, in binding, much of the intention of the artist must be entirely lost. A little bit of eccentricity in this way may have the virtue of novelty; but, if it is to be the rule, why not carry it to the types — say have twenty lines on one page and three lines on another? Surely that would give additional variety. And, except as sketches, is the bulk of the work worthy of serious consideration for the average mind of a high-grade European or American painter.

The colored landscapes have no value. They are little better than what one sees on the five-cent fans which are hawked about the streets when the thermometer is in the nineties. The masks and vases are hardly to be classed among the higher examples of Japanese art. In the collection of Professor Morse we see hundreds of forms that are not only finer, but more typical of "Artistic Japan."

The reeds and flowers are most unquestionably fine — as sketches or decorations, as you will — but we will venture to say that Hamilton Gibson and Harry Fenn have done equally clever work, and certainly truer to nature. This is written in no carping spirit. The comparison may be made by any one who is familiar with the work of these two artists.

In the plates of pure decorative work the Japanese show at their best. Some of the finer bits of close ornamental work might have been done in the American Bank-Note Company's establishment on the geometric lathe; but in the larger, broader examples we have what we have been taught to admire, and our admiration is given most ungrudgingly.

Quaint fancy, delicate invention, curious conceits, run through all; but is this the kind of art before which we must bow the knee? It is most unquestionably clever; but does it fit our needs, may we say our civilization? The brocades and stuffs open up another field. Here we have quiet, harmonious tones that are a charm to the eye, such as the taste of other nations rarely gives us. I fancy it was from such fabrics that the Kensington Art School got its color schemes. They are restful and charming to the last degree.

Some examples of these magnificent weavings may be seen in the Boston Art Museum; but do not some of the embroideries in the same collection, handsome as is the work, "yell" like a newly-gilded sign? Next to frankness and intention, should not all great art have that fine quality, repose? The "Dark Secret" is good for once in a while, as is the circus; but can we live with it?

I am aware of the fact that many artists of rank have been smitten with the Oriental craze, but I do not remember any instance in which their work was seriously influenced by it.

I find in the Japanese colored work nothing but false perspective, bad drawing and flat tints. I speak now only of the landscape and figure work. I see nothing of what is known to us as tone and quality.

The best of the European and American artists have little to learn from our almond-eyed friends in the matter of correct drawing, composition or color, but in metal-working we must take the back-seat.

Their inlaying and carving is superb. Skill and patience they have to a degree that is not possible in the busy whirl of our Western climate.

One word about the covers of the several numbers. Each differs from the other, and each is striking and taking to the eye.

The color-printing on the covers, and through the several numbers on the various full-page plates, leaves nothing to be desired. Gillot has certainly done his work most splendidly; but, after all, is this not Japanese art translated by French process, and is it always at its best?

As art-work, one piece of Morse's pottery — the original work of Japanese hands — is, in the largest sense, worth many numbers of *Artistic Japan.*

[1] *Artistic Japan*: a monthly illustrated journal of arts and industries. Compiled by S. Bing, with the assistance of Mr. William Anderson, MM. Ph. Burty, Victor Champier, Th. Duret, Mr. Ernest Hart, MM. Edmond De Goncourt, Louis Gonse, Eugène Guillaume, Paul Mantz, Professor Roberts-Austen, MM. Roger Marx, Antonin Proust, etc. The English edition is under the editorship of Mr. Marcus B. Huish. London: Sampson Low, Marston, Searle & Rivington.

One Way to get a Gate. — An old tenant-farmer, on paying his rent, told his landlord that he wanted some timber to build a house, and would be much obliged if he would give him permission to cut down what would answer for the purpose. "No!" said the landlord sharply. "Well, then sir," the farmer went on, "will you give me enough to build a barn?" "No!" "To make a gate, then?" "Yes." "That's all I wanted," said the farmer — "and more than I expected." — *Timber Trades Journal.*

SOCIETIES

ENGINEERS SOCIETY OF WESTERN PENNSYLVANIA.

AT the monthly meeting of this Society, held May 21, a large and highly intelligent audience gathered, attracted by the promised light to be thrown on the graphophone and phonograph. The President, J. A. Brashear, occupied the chair. After the election of four (4) new members, Louis S. Clarke gave a very interesting history of the inception of the idea of fixing sound, and the progressive steps to the present graphophone, illustrating his words with diagrams on the black-board and showing the present position of the process by the instruments themselves, which for an hour sang songs, recited pieces, and repeated over and over, what was spoken into them. As yet its main use is to take the place of the stenographer, its record is correct and if the type-writer errs, he can go back to the graphophone and find his error. It is a wonderful invention and no one can say what its future may be. Meeting adjourned at 10 P. M. Next meeting to be held June 18, prox.

COMMUNICATIONS

[The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.]

THE NEW YORK CATHEDRAL COMPETITION.

NEW YORK, N. Y., May 31, 1889.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — At this time when competitions form such an important feature for the selection of designs for all buildings of importance, and are looked upon with so much favor by owners and committees having the selection of an architect at their control, as well as being responded to so universally by architects in general, a few suggestions relative to the advantage and weakness of the system, may not be *mal à propos*. During the past few years much advancement and progress has been made in "Instructions to Architects," whereby the scale, size and number of drawings, positions, angles and distances of perspectives, and the method of rendering are regulated and make the designs uniform and comparable; as regards size, cost and composition these requirements are very generally accepted and adhered to by the competitors, and there is little to be wished for in this branch, unless it be that those having the matter in charge should signify their preference for some particular style, when they are partial to any. Then the efforts of all might be directed in the same channel, thus giving a greater number for the owner to choose from and the exclusion of fewer because of their being of a style not acceptable. This would give to all the same opportunity and not handicap such as have had no personal knowledge of the likes and dislikes of owners or committees previous to receiving the information. The more minute and explicit the directions are, the more nearly will all the contributors hit the mark and more successful will be the competition. With all the advancement for the preparation of drawings, the judging them remains in the same unsatisfactory condition it always has been in, no steps having been taken for improvement, and consequently after each decision there is dissatisfaction among the defeated members, charges of favoritism and unfairness are made and evil is the outgrowth of what should engender only honest exertions and good-natured rivalry. Architects, being intelligent, are quick to see and admit a better thing when the judgment is just, but being human are slow to forget (a real or imaginary) unjust criticism; to avoid which the most particular pains should be taken. The designs should be sent sealed to the judges, and should be regarded by them as strictly private, no one (but the judges) being allowed to see any portion of them until the final decision is made public, (and not as is sometimes the case students, competitors, and strangers being permitted to examine them at leisure). When a decision is made, all the drawings should be on exhibition to the competitors and their friends. The greatest difficulty to overcome, is that of deciding which design offers the greatest advantages and is best fitted to be executed. The system of Judge and Jury of Courts, has been so long tried and is so nearly perfect, as a means of reaching the correct solution of intricate matters, that the same rules that govern the selection and workings of these may well be adopted as the best means of deciding competitions. The judge to be appointed by the owner or committee and the jurors selected from practising architects and engineers, who are not interested personally in the competition, and to be appointed by a vote of the competitors and to be satisfactory to all concerned; by this method, all the various features of the several designs would be picked out and properly weighed and placed to the credit of each competitor according to a carefully prepared table of points which should be named in the paper of instructions. This method would do away with the injustice that is often done to some contributions through the prejudices of one man for a particular school, and would bring about the result of making competitions much more effectual and satisfactory to the principals and architects. The feeling would then be among the members that at least their plans would have proper consideration and representation and stand or fall upon their own merits. The motto system is of but little value for the purpose it is intended (that of leaving the architects' identity unknown). The aim is to secure the best plan; and any architect can form a very good guess of the author of a set by his design, method of rendering, and individualities that must be visible to any one who would be likely to be called as a judge. If this is the case, it seems that a truer insight into the plans might be obtained by permitting each competitor to appear before the judge and jury and explain his plan to, and be examined by them. This method would insure a thorough examination into each design. It would be interesting to know how decisions are arrived at under the present system. They certainly do not always seem to be decided according to the real merit and are often unsatisfactory and extremely uncertain. Take for instance the competition of the Cathedral of "St. John the Divine." There were about seventy designs submitted by architects from home and abroad, among whom were such men as R. M. Hunt, H. M. Congdon, Potter & Robertson, R. W. Gibson, Withers & Dickson, J. C. Cady & Co., Renwick, Aspinwall & Russell, R. M. Upjohn, C. C. Haight and McKim, Mead & White. The name of any of them would be a guaranty of an imposing edifice, all of them having had great experience in church architecture, and are able to show many examples of their work; and yet in the decision, Messrs. Potter & Robertson is the only competitor in the above list that has received mention, the other names being comparatively unknown, and without examples of their work to give confidence that they are able to carry a building of that importance to a successful completion if the work should be intrusted to the care of one of them. The fairness of the decision cannot be admitted, or disputed, until all the designs are exhibited which it is hoped they will soon be, thus assuring the defeated competitors and the profession generally that the judgment has been free from bias. It is a remarkable coincidence, it might almost be said an improbable one, that the lay committee should have selected three designs, and afterward, the expert examiners should likewise have chosen the same three and added a fourth, unless preference had been expressed, or those selected are decidedly the best; but to many it must appear strange, that three of the successful competitors are men recently established in business and that but one of the older and more experienced members of the profession, has been able to furnish anything equal to theirs. Where are we to look for an explanation of three "dark horses" having outrun all the established records. Is it the decline of the older architects, the more than remarkable progress of the coming man, or as they stand are competitions failures?

A NON-COMPETITOR.

[As our correspondent remarks, "the fairness of the decision cannot be admitted or disputed," and need not be, as people know almost nothing about the manner in which the actual decision was made. The tenor of the foregoing remarks, if we rightly apprehend their drift, seems to imply a veiled allegation that in some way the experts are responsible for the existence of a "remarkable coincidence" seeing that the reporters of the daily press have thought fit to assert that the choice of the experts coincided with that made by the trustees. It seems to us that until the experts' report is published all criticisms upon the conduct of this competition should be classed with the statement of the New York *Star* which alleged that "two of the committee of three experts who passed upon the plans of the church were not qualified by education or training for their duty!" — EDS. AMERICAN ARCHITECT.]

NOTES AND CLIPPINGS

WESTERN LAKES DRYING UP. — The lakes in eastern Oregon, as well as in Nevada, are drying up. In some instances the water in the lakes is subsiding because the streams which empty into them have been diverted from their natural channels for the purposes of irrigation, but the continuous drought, doubtless, has had much to do with the low stage of water in them. The *Herald*, published in the new county of Harney, Oregon, says not over four square miles of the original bed of Warner Lake is now covered with water, whereas in 1865 there were seven feet of water where the land is now dry, and this spring a stack containing 300 tons of hay was burned on land which in 1874 was surveyed as Warner Lake. Goose Lake, which once reached Lakeview, Oregon, is now five miles away, and Malheur Lake, in Harney County, is eight feet lower than at any period within the memory of the oldest inhabitant. In this county Humboldt Lake, which some years ago comprised a sheet of water sixteen or eighteen miles long and from eight to twelve miles wide, is now only a few miles long and perhaps a mile or two wide. The Humboldt has not discharged any water into the lake for several years, and a large area, which was covered several feet with water at one time, is now as dry as any other part of the Humboldt Valley. It is a fact, however, that the lake was as low nine or ten years ago as it is to-day, and that five years ago it was as high as it was ever known to be. Immigrants in early days who saw the Humboldt discharge an immense volume of water into the lake, or "sink," as it was called, believed it had a subterranean outlet; but that idea was erroneous, as the volume of water was reduced by evaporation, not drainage. — *Winnemucca (Nev.) Silver State.*

The Suez Canal. — It appears that the number of vessels which passed through the Suez Canal last year was 3,440, of a gross burden of 9,437,957 tons. The corresponding number of vessels which passed through the canal in 1887 was 3,137, of an aggregate burden of 8,430,043 tons; and in 1886, 3,100 vessels, of an aggregate burden of 8,183,313 tons. The transit revenue collected last year was £2,593,291, as compared with £2,314,404 in 1887, and £2,261,095 in 1886. Of the vessels which passed through the canal last year, 2,625 were British, 187 French, 146 Italian, 163 German, and 121 Dutch. No other country figured in the list for 100 ships. The proportion of British vessels passing through the canal is increasing, having been 2,625 in 1888, as already indicated, 2,330 in 1887, and 2,331 in 1886. It will be seen that Great Britain figured for 76 1-4 per cent in the whole movement of vessels through the canal last year; the French proportion being 5 1-2 per cent; the Italian, 4 1-2 per cent; the German, 4 3-4 per cent; and the Dutch, 3 1-2 per cent. It is certainly not a little remarkable that, although the canal was made with French capital, Great Britain has secured the lion's share of the benefits resulting from it. Of the 3,440 vessels which passed through the canal last year, 1,608 went through during the darkness of night. — *Engineering.*

Secret Writing by Means of Typewriters. — A device for secret writing by means of the typewriter is mentioned in the *Paper World* as a recent invention. It requires two typewriters similarly adjusted. They are so constructed that the type can be shifted from their normal position, so that the operator, striking the key in the usual way, really writes other letters than those in his copy, forming a cipher copy. The receiver adjusts his machine in an opposite direction, and writes from the cipher copy, and his machine records the letters of the original copy. The principle is very simple, says the *Mechanical News*, and it at once suggests the possibility of applying the principle of the combination lock to such a contrivance for all typewriters, so that each owner of a machine can set it to any combination, which only he and his correspondent should know. This must be feasible, and if the new invention is of any use at all, its usefulness would be much increased by such a plan.

The Action of Creosote on Chimney Flues. — Attention has lately been called to the peculiarly corrosive, and consequently destructive, effect of the creosote of wood soot upon chimneys, owing to the fact that the creosote thus formed from the slow combustion of wood contains so large a proportion of pyroligneous vinegar or crude acetic acid; this acid being formed in large quantities when the combustion of wood is slow, many quarts, in fact, being condensed in cold weather where a large wood fire is very much checked, only a few hours being required for such condensation. The acid in question dissolves lime readily, carrying it away in solution, and in this manner the mortar is frequently entirely removed from the tops of chimneys in the country, new ones suffering in the same way as the old, instances being numerous where the top courses of brick in chimneys only two years old have become entirely without support other than that afforded by the sand with which the lime was mixed. — *Philadelphia Press.*

Animal Life in Well-water. — The fauna of well-water, as shown by Professor Vejdovsky's examination of 231 wells of Prague, comprises 111 species of organisms, including 20 varieties of amœba-like organisms, 12 varieties of flagellate infusoria, 45 varieties of other infusoria, 24 varieties of worms, and 10 varieties of crustacea. These varieties are washed by surface water into the wells, where they live in the mud on the bottom, their presence in the water above being indicated by a turbid appearance. Danger from wells containing them arises chiefly from the putrefying organic matter supporting them, which greatly favors the development of fungi which prey upon the human body. — *Exchange.*

The Babylonian Expedition. — Since the beginning of February, the Babylonian expedition sent out by the University of Pennsylvania has been exploring the ruins of Niffer, whose site is marked by an immense mound, about sixty miles southwest of ancient Babylon, and bordering on the Afflosch swamps, so-called from the tribe of Affik Bedouins that dwell near by. Niffer is identical with old Babylonian Nippirn, founded about 3,000 years before the Christian era. In its ruins lie buried the remains of the famous Bel temple, which will be systematically explored and doubtless yield splendid results. — *Jewish Messenger.*

Ancient Tombs discovered at Naples. — A subterranean chamber has been discovered under a house on the hillside at Naples. Along the centre runs a mosaic pavement and on each side there is a double row of sepulchres hewn in the rock, the fronts of which are stuccoed and painted and decorated with terra-cotta and marble reliefs. Within the tombs were perfect skeletons, vases and other objects, the antique lamps being in such good condition that when the new find was inspected by a party of German archæologists the workmen made use of them to light up the vaults. The many well-preserved inscriptions are chiefly in Greek, with some Latin, and prove that the epoch of these tombs was about 1,000 B. C. Other tombs in a second chamber have not yet been excavated. Similar catacombs have heretofore been found in this locality. — *Pall Mall Gazette.*

The Egypt Exploration Fund. — Few educational enterprises have yielded larger results for the amount invested than the Egypt Exploration Fund. Expending annually since 1883 between $7,000 and $8,000, it has discovered or disclosed the following interesting sites; Pittrom (the treasure city of Exodus i, 11). Goshen Tahpanhes (the Daphnæ of the Greeks), the city of Onias, Zoan, Am, Naukratis, and, latest of all, Bubastis (the Pi-Besetti of the Scriptures). These discoveries have been conducted in a thoroughly scientific manner and have yielded rich results regarding the sciences, arts and industries of past ages, the early sources of Greek history, and particularly Bibical and secular history. — *The Chautauquan.*

TRADE SURVEYS

A vast amount of projected work depends upon the establishment of, or rather, the restoration of, confidence among investors, native and foreign. Years ago, the bulk of railroad construction was done out of the pockets of outsiders. Now it is done mainly out of the earnings of existing companies. Home investors are incredulous and suspicious, and many foreign investors are quietly refusing to part with their money in new American railway enterprises. Notwithstanding these things, the streets bear rumors of parallelling schemes under the management of parties deeply interested in existing lines, and these rumors aver that these new roads are to be built to depreciate the stocks of established lines, in the interest of huge stock-jobbing speculators. Be they true or false, they go to show that the arena of conflict between opposing speculative interests is to be widened and lifted out of the old ruts. These schemers assert that speculative capital must have employment, and that there is no more inviting field for its operation than in hammering down values on old lines by the uncalled-for construction of new ones. The effect of such a policy would naturally be to reduce the capitalization of a vast amount of existing railway property, and on the outside public the results would be rather beneficial. Wild as such a scheme may appear to be, its conception is natural and logical, and its outcome would probably be a consolidation in greater or less degree of existing competing lines. In fact, this very result has more than once been predicted by leading railway authorities as inevitable and desirable when the inevitable arrives. The mob spirit has animated capital thus far in much of the construction that has been done. Scientific or economic considerations have played a minor part in the work. The result has been a withdrawing of small investors on one hand, and a precipitation of tariffs on the other, accompanied by protective legislation and agencies in the shape of commissions. The point on which large investors are most concerned is: How can the railroad problem be so disposed of as to open up safe and abundant opportunities for investment? This element has favored commissions to that end. Up to present writing they have not answered expectations. Railroad companies are disposed to monopolize all good opportunities, and to build roads before they are needed to that end. There are paper roads now built over 40,000 miles long. Some count over 50,000 miles. It is said in financial circles there is enough money to build them. It is demonstrated that labor, material, machinery and equipments are as low as they are likely to be for years; hence there is no risk in building new lines if the builders can afford to wait. But right here is the secret. The brains want just enough outside capital in their companies to kick in or out, up or down, as it suits them, and in this way, by temporarily depressing stocks and compelling these outsiders to sell out at a sacrifice, to make their roads cost them practically so much less. In short, outsiders are to be let in to help build new roads, and then be kicked out, with a dime for their dollar. Englishmen see and stay out. For all this, there will be enough sheep to help out this programme. The manipulations are being shrewdly carried on. Commercial indications are favorable. The volume of business is ahead of last year, though just now freight shipments East over the trunk-lines are one-half what they were last year. Money is extremely active, loans at New York one day last week reaching the highest known limit of $412,500,000. Considerable gold shipments have been made lately, and the English banks now hold fifteen million dollars more than last year.

The earnings on seventy-three roads for third week of May show a slight increase over same week last year. The iron trade shows more strength. Last week 90,000 tons of steel-rails were sold, and there are inquiries for about seventy thousand tons, for new roads mostly. Crude-iron production is maintained throughout the country, but the Northern furnaces are restricting while Southern are expanding output. The month of June will be a good one among makers of pipe, plate, sheet and structural iron. Producers of anthracite coal have advanced prices 10 to 25 cents East, West and South. Output up to date is 1,312,453 tons less than last year. Soft and splint coal production is about the same as last year. Strikes have temporarily restricted output in a few localities, but this is made up elsewhere. The lumber trade is active, and for the most part prices are maintained. Lake and coast tonnage craft are crowded with contracts. Prices have weakened at some points. One of them Chicago. One reason is that hardwoods are crowding out softwoods. New kinds of wood are being used for flooring, ceiling and general interior finish. Even yellow pine that promised to sweep white pine out of the market for interior work is itself feeling the pressure of other and more desirable kinds. Eastern Michigan lumber manufacturers will cut 200,000,000 feet less than last year, and mills will probably shut down September 1. The action of the poplar association in raising prices is generally favored among middlemen who hope thereby to increase their margins. Indian and Chinese labor is being extensively used in British Columbia to manufacture lumber to the disadvantage of competing interests on the American side, and Norwegian sailors are monopolizing the ocean traffic. Alaska cedar of a quality far superior to Puget Sound cedar is being introduced on the Pacific coast. It cuts 50 per cent clear. South American lumber markets are taking large quantities of spruce and pine from American and Canadian markets, and also large quantities of the best lumber on the Pacific coast. The Liverpool, England, market is calling for heavier supplies of American lumber, soft and hard; poplar, walnut and Southern pine are particularly wanted. British markets are absorbing much larger quantities of lumber, and dealers are carrying more abundant supplies. In manufacturing circles on this side predictions continue to be made of an advancing tendency in raw and finished markets. The most impartial observation fails to develop strong arguments in support of this view. Producers in all industries have brought about a coöperation of effort that makes a gorging of trade channels next to impossible. Years ago there was no machinery for such purpose, and there was besides a lack of confidence. Disasters and depressions have taught business interests to hang together, and it is this fraternization that saves losses and gives to trade movements a greater regularity and certainty. Hence it is that no sudden expansion of values can be reasonably looked for; besides capacity is equal to an extraordinary demand. It is this trade combination that accounts for the carrying of more moderate stocks, and for the policy now so generally pursued of working on orders. Viewing the industrial problem from every side, it is impossible to infer with good reason that a sudden expansion of values is probable. The reaction in Great Britain to stronger prices is simply a return to normal values. That activity will probably continue a long time because distant regions are being filled up with an enterprising and industrious population whose labor under these new conditions will be much more productive than under former crowded conditions when competition restricted earning power at minimum limits. In our own land all the agencies visible are working in the direction of lower prices, in spite of the syndicating tendencies.

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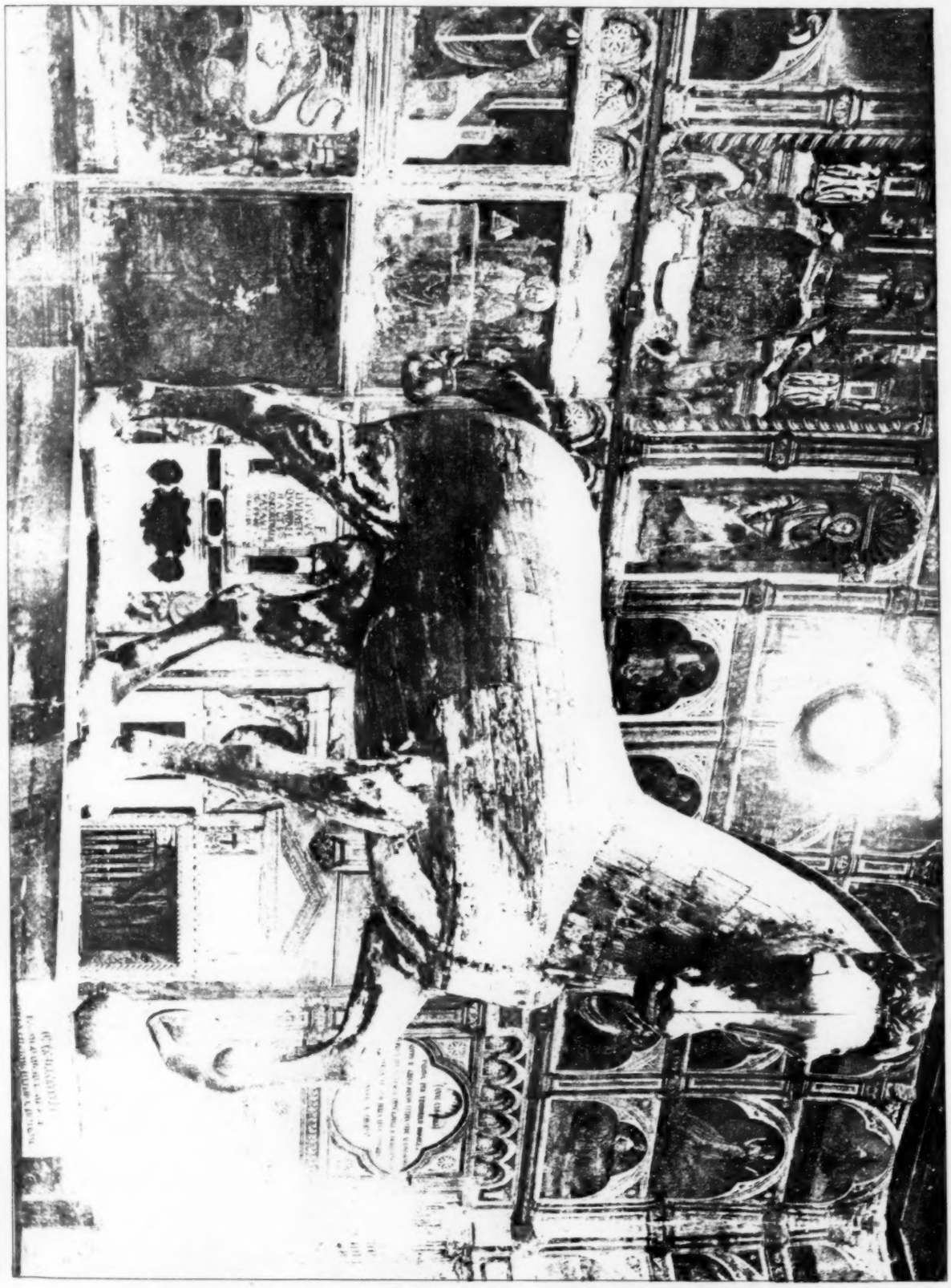

WOODEN MODEL OF GATTAMELATA'S HORSE.
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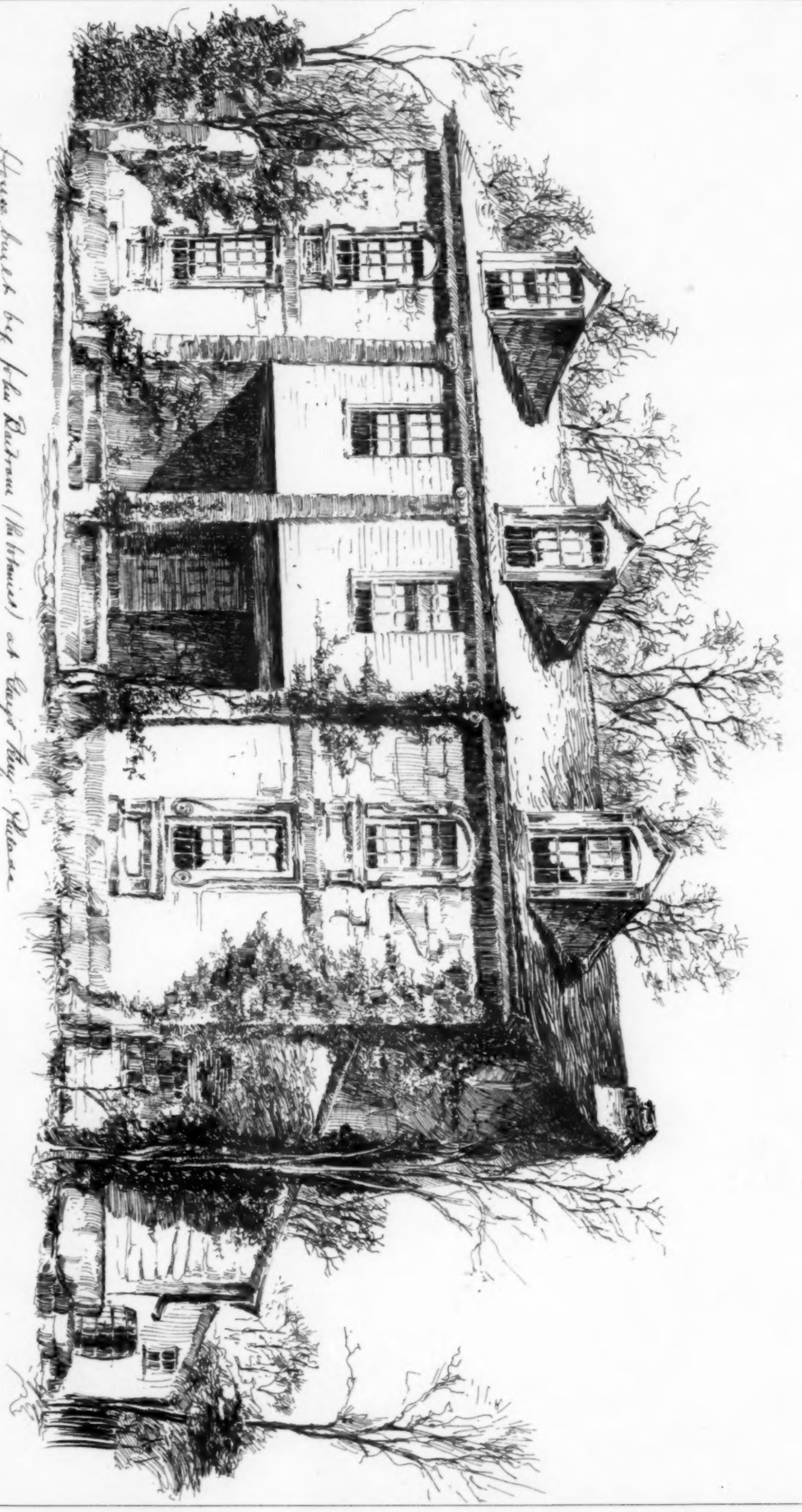

House built by John Bartram (the botanist) at Kingsessing, Philada. Built 1730.

Drawn for "Harper's" by Jno. C. Hemy.

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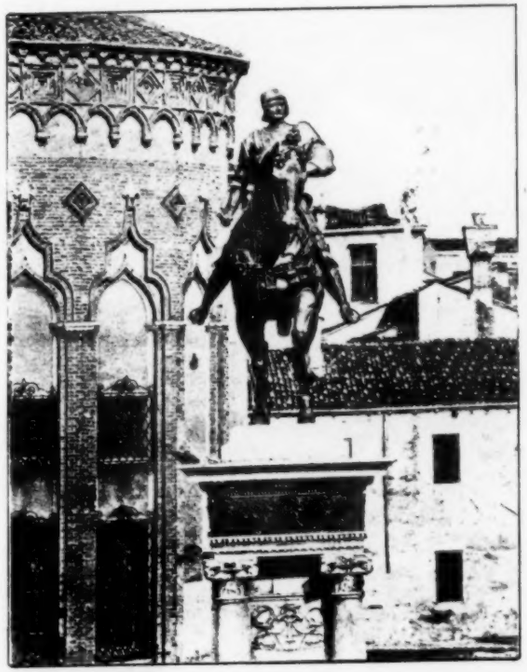

STATVE OF COLLEONI, THE SCHOOL OF ST MARK AND THE CHVRCH OF SS. GIOVANNI E PAOLO.
VENICE, ITALY.

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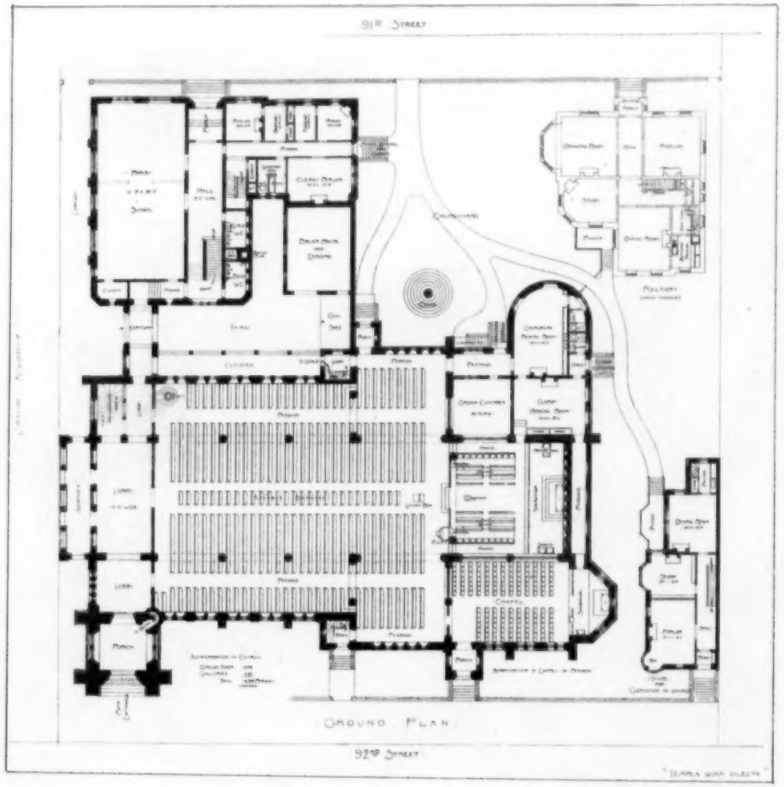

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: NORTH-EAST · VIEW :

" · TEMPLA · QUAM · DILECTA · "

F. C. WITHERS
ARCHITECT

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